GROWTH IN CENTRAL BOSTON

A Study of Development Capacity

City of Boston
Raymond L. Flynn, Mayor
Redevelopment Authority
Stephen Coyle, Director

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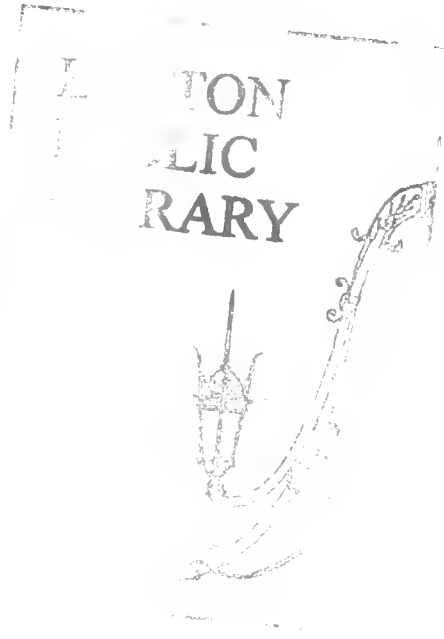
A STUDY OF DEVELOPMENT CAPACITY



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INTRODUCTION

The BRA has initiated a project to articulate development policies for Central Boston. The first phase culminated in two reports, "Boston Tomorrow, Issues of Development" and "Boston Tomorrow: Background in Development" which examine the impacts of current and future residential, office, commercial, industrial and institutional development on urban design, environmental quality, energy, infrastructure and employment.

Although much of the discussion in these reports centers around Boston's potential for new growth, no assessment has been made regarding the physical land use capacity of the City. The following study, entitled "Growth in Central Boston: A Study of Development Capacity", has been undertaken to assess the area's physical ability to absorb new development. Through a process of isolating vacant and underutilized land areas in the Central City, and contrasting existing zoning regulations with current development trends, "Growth in Central Boston" determines the growth capacity of potential development sites within specific city boundaries.

The data employed to locate clearly available development parcels and identify proposed development plans was accumulated in 1982. The findings as reported in this study are therefore an estimate of current development capacity and provide a general framework for evaluating future growth within the City. As either vacant or underutilized parcels are developed, the landscape of Central Boston and potential for growth is altered. This attempt to quantify capacity is therefore more reflective of the need to understand and convey information concerning possible location and density of future development, rather than to present static square footage estimates of real estate growth. Moreover, the methods selected to quantify growth capacity represent only one approach for tackling the complex issues surrounding location and density questions. The study does, however, demonstrate the very large capacity for real estate growth within the city limits and a possible future if no policies are developed to target that growth.

Development capacity, as defined in this study, is determined by both land availability and land density. However, another crucial determinant of a city's capacity to absorb new growth is the capability of its infrastructure, namely transportation, sewer and water supply systems to support further development. Research is currently underway at the Boston Redevelopment Authority which studies the interplay between Boston's existing infrastructure capacity and future development.

City officials, planners and other decision-makers will best be able to articulate new directions for Boston with this comprehensive analysis of the relationship between development and land availability, infrastructure capacity, and the policy goals to which the City of Boston aspires.

EXECUTIVE SUMMARY

METHODOLOGY

"Growth in Central Boston: A Study of Development Capacity" is presented in two sections. Section I describes the first development scenario tested to determine capacity, namely the potential for growth on vacant lands and buildings in the Central City. This scenario assumes that only clearly available land sites will be developed, in conformance with existing zoning regulations. Clearly available land includes parking lots, vacant land and abandoned buildings which are not prohibited from development.

Section II contains a second scenario for development which looks at districts where recent and proposed development activity exceeds traditional zoning densities for the area. Based on the assumption that current trends, rather than existing zoning regulations, most accurately reflect an area's potential for growth, the second scenario calculates square footage of development potential according to the average density of recent real estate projects. The potential development sites reviewed in Section II include both the clearly available parcels evaluated under Scenario I and sites which have been developed at a lower density than surrounding new and proposed construction. The development capacity estimated in Scenarios I and II represents the potential growth in the study area, over and above existing development, and is referred to as "net new capacity" throughout the study.

In addition to net new capacity, Scenario II presents another analysis which quantifies land use changes within certain neighborhoods. This second estimate, termed "replacement capacity", combines a square footage measure for previously developed buildings which are projected to undergo a shift in use with the aforementioned net new capacity figure. This analysis, therefore, demonstrates the potential for development of new uses in target areas throughout Central Boston. For example, in Fort Point Channel and certain portions of the Financial District where manufacturing and warehouse space is prevalent, development trends indicate a shift to commercial and residential uses. These trends are quantified under Scenario II.

The study boundaries encompass eleven analysis areas that are within the BRA's planning jurisdiction and are expected to experience development activity during the next decade. (Please see Scenario I Boundary Map.) The study area includes the Downtown, Downtown Waterfront, South End, Fenway, an area which encompasses Dudley Station, Crosstown Industrial Park, and parts of the Southwest Corridor. These analysis areas were delineated to reflect boundaries of established neighborhoods or market areas and to permit data collection along physical lines that are compatible with other planning studies.

Scenario II addresses only those analysis areas within the total study area where the density of recent or proposed development exceeds the dictates of existing zoning regulation. The Downtown Waterfront, East Boston Piers, Charlestown Piers, Fort Point Channel and the Financial District have been targeted for Scenario II analysis. (Please refer to Scenario II Boundary Map.)

FINDINGS: SCENARIO I

The entire study area contains approximately 30 million square feet of vacant land and parking lots. If these vacant parcels were developed at the maximum allowable density and in accordance with the primary land uses permitted under existing zoning regulations, the total floor area would equal approximately 74 million square feet. Table A shows the total land and potential floor area divided by primary zoning use and land use.

Table A
Scenario I: Net Development Capacity of Clearly Available Lands Under Existing Zoning
(in millions of sq.ft.)

Primary Zoning Use	Zoning District	Sq.Ft. Land	Sq. Ft. Building
Commercial/Mixed	B, L	7.2	22.5
Residential	H	4	9.7
Industrial	M,I,W	18.5	41.3
TOTAL[1]		29.7	73.5

Land Use	Sq.Ft. Land	Percent of Total
Parking Lots	10.6	36%
Vacant Land[2]		
Taxable	7.2	24%
BRA	5.1	17%
City	.5	2%
Other tax-exempt	4.1	14%
Vacant Buildings	2.2	7%
TOTAL[1]	29.7	100%

1. Entries may not add up to totals due to rounding.
2. The category "vacant land" is exclusive of parking lots.

FINDINGS: SCENARIO II

The estimated net development capacity for the analysis areas within Scenario II is approximately 57 million square feet of commercial/mixed use floor area and a relatively small portion of light manufacturing and water-related industry uses. Should the land uses change in certain portions of the study area and existing floor area become available for new uses

("replacement capacity"), the growth capacity would increase in the Downtown Waterfront, Fort Point Channel and Financial Districts. Table B shows the net new development capacity and replacement capacity estimates for each district within the study area for Scenario II.

Table B
Net Development Capacity of Clearly Available Lands and Development Sites Under Scenario II Assumptions
(in millions of square feet)

District	Primary Use	Net Capacity Square Feet Building	Replacement Capacity Square Feet Building
Financial	mixed	28.5	incomplete information
Downtown Waterfront	mixed	2.9	3.1
Charlestown Piers	mixed	3.4	3.4
East Boston Piers	mixed/industry	3.9	3.9
Fort Point Channel	mixed	18.5	21.6
TOTAL[1]		57.2	N/A

1. Entries may not add up to total due to rounding.

SECTION I

SCENARIO I: DEVELOPMENT CAPACITY OF VACANT AND UNDERUTILIZED SITES

In Scenario I, the development capacity of Central Boston is defined as the potential floor area of clearly available parcels of land which could be developed in accordance with current zoning regulations. For the purposes of this study, "clearly available land" refers to vacant sites, land parcels which house abandoned buildings, and parking lots within the study area. Scenario I analyzes these land parcels to determine which are not developed to the maximum density permitted under the existing zoning code and translates this information into square footage of potential development.

Findings

There are approximately 30 million square feet of clearly available land area within the Scenario I study boundaries. According to existing zoning regulations, this land could yield over 73.5 million square feet of building space if developed at the maximum allowable density.

Table A on page 7 demonstrates the net development capacity of clearly available lands according to existing zoning regulations. Our findings show that over half of the clearly available land area within our study boundaries (62%) is industrially zoned, yielding slightly more than half of the potential building square footage (56%) if all available sites are developed to capacity.

Approximately 7 million square feet of clearly available land is presently zoned for commercial use, which would support nearly 23 million square feet of commercial and mixed use building space. Commercial uses represent approximately 25% of the total sites and potential floor space within our study area. Residentially zoned parcels comprise only 14% of the clearly available land and 13% of the potential building square footage.

The current square footage and percentage allocations of clearly available development parcels by land use are also delineated on Table A, page 7. Both taxable and tax-exempt land used for parking comprise the largest portion of clearly available land in Central Boston, or approximately 36%. Slightly less than one quarter of the total land of 7 million square feet is taxable vacant land (exclusive of parking) while 17% of the available parcels are vacant and owned by the BRA.

The greatest concentration of available vacant land can be found in Fort Point Channel (28% of the total), the Charlestown Piers (17%), and the area encompassing Dudley Station, Crosstown Industrial Park, and parts of the Southwest Corridor, (18%), which, with the exception of the Charlestown Piers, contain large industrial tracts. With almost 9% of the total land area, the Fenway also shows much potential under Scenario I assumptions. About half the land in this analysis area is zoned for residential use. The Financial District contains only about 8% of the total land area, but if developed

* Floor Area Ratio (FAR) = Floor Area divided by parcel size.

according to existing zoning regulations, can yield 23% of the total Scenario I floor area. The potential floor space in the Financial District is primarily zoned for commercial and industrial uses. In addition to the Fenway, Beacon Hill-West End and the South End contain a large percentage of available parcels in residentially zoned locations. The South End shows an equal number of residential and industrial parcels, nearly 40% in each category.

The distribution of clearly available land parcels is demonstrated on the set of maps entitled, Scenario I Clearly Available Lands, which has been inserted at the end of Section 1 of this report.

Table C: Scenario I Development Capacity by Analysis Area
(in millions of sq.ft.)

	Residential		Commercial		Industrial		TOTAL*	
Analysis Area	S.F. Land	S.F. Bldg.	S.F. Land	S.F. Bldg.	S.F. Land	S.F. Bldg.	S.F. Land	S.F. Bldg.
Charlestown	.59	1.18	3.45	3.45	.98	1.62	5.03	6.25
East Boston	.01	.01	0	0	1.91	3.82	1.92	3.83
Financial	.04	.11	1.21	9.92	1.18	7.04	2.42	17.07
Waterfront	.08	.24	.12	.75	.77	1.59	.97	2.58
Beacon Hill/ West End	.31	.90	.09	.29	0	0	.41	1.19
South Cove	.02	.03	.61	3.99	.03	.28	.66	4.30
Back Bay	.06	.19	.14	.93	0	0	.20	1.12
South End	.62	1.65	.38	.85	.61	1.04	1.61	3.54
Dudley/ Crosstown/ SWCP	.92	1.59	.49	.57	4.05	7.52	5.46	9.68
Fenway	1.36	3.79	.68	1.75	.55	.98	2.59	6.52
Fort Point Channel	0	0	0	0	8.40	17.43	8.40	17.43
TOTAL	4.01	9.69	7.17	2.25	18.48	41.32	29.67	73.51
(% Total)	(14%)	(13%)	(24%)	(31%)	(62%)	(56%)		

*May not add up due to rounding.

Methodology

The methodology used to calculate development potential in Scenario I is described below.

Step 1: Inventory

The first step in Scenario I was to locate and map all of the clearly available land in Central Boston and record the zoning and land area of each parcel on accompanying inventories.

Clearly available land was inventoried under the following categories:

(1) Taxable vacant land
(2) BRA-owned vacant land
(3) City-owned vacant land
(4) Other tax exempt vacant land
(5) Parking lots (includes private, BRA, City and other public ownership)
(6) Private vacant buildings
(7) BRA vacant buildings
(8) City vacant buildings
(9) Other agency vacant buildings

Several assumptions were made regarding information used to compile the inventory. First, the Office of Property Equalization (OPE) Inventory of vacant land only includes unimproved parcels of land, assessed as completely vacant. Vacant land that is within an "improved" parcel (a parcel that contains a structure or other improvements) does not appear on the list. The OPE inventory therefore undercounts vacant land. In areas of the city where we identified significant undercounting, such as in the proposed Enterprize Zone, we supplemented the inventory with 1979 aerial photos to locate more vacant land.

Further, there were discrepancies in listed ownership among the City, BRA, and private entities. When overlap occurred, the most recent inventory from OPE was used to identify ownership followed by the BRA and the City lists. The BRA inventory categorized parcels occupied by public facilities, parks, or realigned streets as "vacant land". These parcels were identified where possible and excluded from the inventory.

Inventories of parking lots were often inconsistent with respect to location, land area, and number of lots. Because parking lots were not distinguished from "vacant land" in the OPE, BRA, or City inventories, there were often overlaps between parking lot and vacant lot inventories. By locating parcels from all lists, the possibility of double counting land area was minimized, although not completely eliminated.

A comprehensive inventory of vacant buildings was unavailable. The best information source was an inventory of recent (1981-1982) active building code violations that includes vacant buildings which have been boarded up through public expenditure. Thus, the inventory of vacant buildings is limited to publicly maintained or owned structures, and significantly undercounts this category of land use.

Step 2: Mapping

A set of five 200-foot scale base maps were created and all clearly available parcels, according to the nine categories of land use and ownership, were mapped. This mapping process required two steps. Since the inventories listed parcels by street address and the study area base maps did not display addresses, parcels had to be located on the BRA 100' scale maps and transferred to the study maps.

Steps 3 and 4: Analysis of Zoning Regulations

Step 3 involved aggregating the clearly available land areas by analysis area, current land use (vacant, building, parking lot), ownership (taxable, BRA, City, tax-exempt agency) and zoning district (commercial/mixed use, residential, industrial). The zoning designations were then analyzed in Step 4 to determine their effect on development potential.

Scenario I assumes that the development potential of clearly available land reflects existing zoning. There are two basic components to zoning designations: zoning district and density. Zoning district refers to the type of development which is appropriate on a given site, such as residential, commercial/mixed or industrial use. "Floor Area Ratio, (FAR), which is the ratio of floor area to land area, is the term employed to delineate the density of development.

In this study, the major land use category permissable under the zoning district and FAR were identified and parcels assigned to that use. In reality, zoning districts permit more than one land use or FAR. Further, certain other uses are permitted under a Conditional Use Permit and "nonconforming" uses generally prohibited in a zoning district are permitted with a zoning variance issued by the City's Zoning Board of Appeals. Building densities may also be exceeded under zoning variances.

For the purposes of this study, however, land use was generalized to one major use category and FAR's stated in the zoning district were assumed to represent maximum allowable density. Table D lists the zoning districts, their major uses (the other permitted uses appear in parentheses) and the range of stated FAR's found in the study area.

Table D: Zoning Districts and Major Uses in the Study Area

Zoning	Major Use (Other Permitted Uses)	Floor Area Ratios*
H	Residential (business)	1-5
L	Commercial (residential)	1-2
B	Commercial (residential; light manufacturing with permit)	2,4,8,10
M	Light manufacturing (commercial)	1,2,4
I	General industry	2
W	Water-related industry	2

* Floor Area Ratio (FAR) = Floor Area divided by Parcel Size.

Development potential is also influenced by the Special Purpose Overlay District (SPO) and other legal designations that regulate land use or the character and intensity of development. An SPO is part of the City's Zoning Ordinance, whereas other designations are created by federal and

state legislation, such as Urban Renewal Areas and Historic Districts, respectively. Table E shows the SPO's and other designations found in the study area and outlines their broad effect on development potential.

Although all the overlay designations were recorded for each parcel in the inventory, only the Urban Renewal Areas, Historic Districts, and National Register Districts were aggregated because they have the greatest potential impact on stated land use and density. However, as it is impossible to accurately predict how these overlay districts would change the development potential of clearly available lands, only the existing two-component zoning designation, land use and FAR, was applied in the calculation of floor area.

Table E:

Special Purpose Overlay Districts and
Other Overlay Districts in the Study Area

Name	Designation	Effect on Development
Urban Renewal Area (URA)	Other	BRA review power.
Disposition parcel in URA	Other	BRA development controls. Can effect use and density.
Urban Renewal District (U)	SPO	Specific requirements developed by BRA. Can supercede zoning.
Planned Development Area (PDA)	SPO	Specific development plan, may vary from zoning. Does not apply to unplanned vacant land.
Adult Entertainment District	SPO	Regulates adult entertainment uses. Does not affect density.
Historical District (HD)	Other	Building facade control. Can limit development.
National Register District	Other	Preservation incentives. May influence scale of development but in general, slight effect.
Institutional District	SPO	Requires special permit for institutional uses. Affects specific land use, not density.
Flood Hazard District	SPO	Regulates elevation of ground floor in 100-yr. flood plain. No effect on Scenario I analysis.
Restricted Parking District	SPO	Regulates parking. No effect on Scenario I analysis.

Step 5: Calculation of Land Use and Floor Area

The information for each parcel was computerized by land area, planning district, land use, zoning district, FAR, and overlay district(s). Land area and floor area were aggregated by the same categories. The potential maximum floor area was derived by multiplying the land area by the Floor Area Ratio permitted in the zoning district. The total land area of all parcels in a B-10 zone, for example, were multiplied by FAR 10 to determine the maximum allowable floor area. Finally, a major land use was assigned to the zoning district, and floor area was categorized by residential, commercial/ mixed or industrial use. The results are summarized in Table C in the text.

Analysis Area Descriptions

The size, parcel distribution, zoning designations and surrounding land uses of the districts analyzed in Scenario I are presented in the following section. The size and distribution of available development sites affect capacity by influencing the potential for large scale development possible on contiguous or large sites, versus small, scattered projects. The existing zoning designations and surrounding land uses are described, particularly if adjacent uses differ from the major use of the zoning district.

East Boston Piers - The major portion of vacant land is concentrated within a few piers, ranging from about 90,000 to over 800,000 sq.ft. The entire analysis area is zoned for water-related industry, although commercial and some residential uses exist on adjacent parcels.

Charlestown Piers - The area contains two major land parcels, namely, the Charlestown Navy Yard and Hoosac Pier. The Navy Yard is zoned for residential and commercial uses at a floor area ratio of 2, and Hoosac Pier is zoned for industry. However, since the entire district is in an Urban Renewal Area, the development will not necessarily conform to existing zoning regulations.

Financial District - This district is one of the most complex with regard to the distribution of vacant land and zoning. The large vacant parcels are used as parking lots, and located in the North Station area, within industrial zones. However, North Station is within an Urban Renewal Area, where plans call for commercial and residential uses. The rest of the district is primarily comprised of scattered sites located in commercial zones. Several parking lots of approximately 10,000 sq.ft. are located around the Batterymarch Street area, Government Center, and the Theatre District.

Downtown Waterfront - Small, scattered vacant and underutilized land parcels characterize the North End, which is zoned for residential and local retail uses. The Boston Waterfront area contains large vacant piers zoned for light manufacturing. However, Waterfront zoning is currently under review by the BRA.

South Cove - The entire district is within an Urban Renewal Area zoned for commercial and residential uses. There are a few large parking lots and parcels of vacant land along with small lots of approximately 5,000 sq.ft. The adjacent land uses generally conform to existing zoning.

Beacon Hill/West End - Parcels of vacant land in Beacon Hill are small (less than 1,000 sq.ft.) and scattered, adding minimal potential floor area to the district. The West End contains a major parcel off Cambridge Street and another adjacent to North Station, which are zoned for commercial and residential uses respectively, and are governed by an Urban Renewal Area designation.

Back Bay - Most of the available sites are medium-sized parking lots (7,000-10,000 sq.ft.) concentrated near Boylston Street. The area north of Boylston Street is within an Historic District and subject to design review by the Back Bay Historical Commission. Boylston Street zoning is currently being studied by the BRA and a citizens review committee.

South End - Individual land parcels, scattered sites and concentrated blocks of vacant land characterize the South End, under a variety of zoning classifications (residential, commercial, and industrial). The potential floor area computed for this neighborhood represents both opportunities for large and small scale development.

Fenway - The vacant land in the East and West Fens is concentrated in a few large parking lots, zoned for residential and commercial use. The East Fens is within an Urban Renewal Area and development may differ from existing zoning regulations. Scattered, small sites are found in the East Fens in the residential neighborhood adjacent to Symphony Hall.

Southwest Corridor/Dudley/Crosstown - Large tracts of vacant land and a series of small but contiguous parcels are found throughout this area. The development capacity figures primarily reflect opportunities for large scale development on adjacent or large parcels rather than on infill sites.

Fort Point Channel - The clearly available land in the Fort Point Channel is concentrated in large (600,000+ sq.ft.) industrially zoned tracts of land. In the "Warehouse District", scattered vacant parcels and buildings average about 8,000 sq.ft. per parcel. Thus, floor area figures for Fort Point Channel primarily represent development potential on large sites.

SECTION II

SCENARIO II: DEVELOPMENT CAPACITY OF POTENTIAL DEVELOPMENT SITES

Scenario II analyzes the central city's capacity for development under land use and density assumptions that reflect current and expected development trends, rather than existing zoning. Both clearly available sites (from Scenario I) and sites that are presently developed but may have further development potential under new density criteria are analyzed as potential development sites.

Findings

The net new capacity for the analysis areas evaluated under Scenario II is approximately 57 million square feet of primarily commercial and mixed uses and a small percentage of industrial uses. This represents a 21% increase over the development projected under the first scenario for approximately the same study area, which measured potential according to existing zoning rather than current trends. The increase in building square footage is caused by the capacity of developed sites for more intensive development. Therefore, continuation of current activity levels, rather than strict adherence to the Zoning Code would augment the real estate growth in Central Boston according to our analysis.

"Replacement capacity" has also been computed in districts for which inventories of floor area by building use have been conducted. The net capacity increases demonstrated in the Downtown Waterfront, and the Fort Point Channel are a result of floor space reuse. Table F summarizes the net new development and replacement capacity estimates under Scenario II.

Geographic Boundaries for Scenario II

The Scenario II analysis is confined to districts where recent or proposed development has or will outstrip density limits permitted under current zoning regulations or where land use changes have occurred. This area includes the Downtown Waterfront, East Boston Piers, Charlestown Piers, Fort Point Channel and the Financial District.

The Financial District has been further subdivided into ten subareas to permit a more detailed evaluation of new development capacity and to reflect the varied character, market, and scale of development within the downtown. The Financial District was broken down into the following subareas: Financial, Government Center, Broad Street, Retail, Theatre, Park Plaza/Back Bay, North Station, Leather District, and Bulfinch Triangle.

The additional net square footage which would result from building renovation or small scale redevelopment projects within the study boundaries has not been included in the net capacity calculations. Therefore districts with primarily small scale redevelopment activity were eliminated from Scenario II analysis. The rationale for eliminating specific districts from Scenario II follows.

South End: The most frequent development activity is residential renovation but there are no major redevelopment plans on line for existing developed lots, (with the exception of the Tent City Site).

South Cove: The area is built out to or beyond existing zoning and BRA policy for the area is to maintain existing uses and densities.

Dudley Station/Crosstown/Southwest Corridor: Extensive development activity is proposed for these areas on vacant and underutilized land. At this time there are no indications that development would exceed existing zoning. Therefore, Scenario I calculations reflect development potential for much of the area.

Beacon Hill/West End, Back Bay: Beacon Hill and the Back Bay are historic districts and are therefore considered unavailable sites. The portion of the Back Bay nearest Boylston Street from Berkeley to Arlington Streets is analyzed as an extension of the Park Plaza subarea of the Financial District.

North End: Residential and commercial renovation is prevalent but no major change in density or use is expected.

Fenway: Although renovation and redevelopment activity is occurring in this district, no significant deviation from current zoning regulation is anticipated.

The development potential calculated in Scenario I for clearly available sites has been used to approximate the capacity for analysis areas not reviewed in Scenario II.

Methodology

Step 1: Identify Potential Development Sites

Scenario II of the Development Capacity Study analyzes land with the potential for increased density and computes net new development capacity through a four step methodology. To identify potential development sites, five classes of land or building types were defined as clearly unavailable for future development and eliminated from the analysis. The remaining locations were considered potential development sites. Clearly unavailable sites were defined according to their uses as of October, 1982, as follows:

- New Construction: Buildings constructed after 1960 which are unlikely to be redeveloped.

- Recently Rehabilitated Buildings: Buildings which have been renovated since 1970 and are unlikely to experience new development in the forseeable future.

- Historic (Landmark) Buildings and Districts: Buildings that have been designated or are eligible for Landmark Status, as identified by the Boston Landmarks Commission, are eliminated as development sites because their legal status prohibits significant change. While

historic buildings may undergo renovation, any resulting net addition to the City's floor space will be minimal. Similarly, the two Historic Districts designated by state legislation - Beacon Hill and the Back Bay - while undergoing renovation activity, are not likely to experience an increase in square footage. (Boylston and Arlington Streets in the Back Bay are exceptions to this and are analyzed in Scenario II).

- o Designated Open Space: Parks and other lands designated by the City or the BRA are considered unlikely development sites.

- o Institutional Buildings and Special Cases: These include currently active police and fire stations, schools, and hospitals. The New England Telephone Buildings that contain specialized wiring and equipment are also unlikely to be redeveloped.

The remaining parcels were considered potential development sites and were evaluated for net new development potential. All potential sites fall into one of the following land categories:

- o Sites with plans: A development program (generally conceptual) has been formulated for these sites.

- o Sites with no plans: As of January, 1983, no plans have been formulated.

- o Clearly available sites: Vacant land, buildings, and parking lots identified in Scenario I. These sites may also be included in Category 1, Sites with Plans.

Step 2: Establish New Zoning Guidelines

New density and land use criteria for the development sites with no plans were delineated in Step 2. In several geographic areas, recent activities concerning land use and density differ from existing zoning guidelines. Since the City's development capacity, as measured by existing conditions, planned development and probable future activity, often exceeds current zoning, new density criteria for development have been determined. These new criteria have been applied to development sites without plans and clearly available sites to determine potential use and floor area.

Two methods were used to compute new zoning criteria, one for the major portion of the Financial District and one for other areas that are projected to undergo major changes in use, but as yet have no precedents for density. In the Financial District, the existing zoning districts, B-8 and B-10, permit commercial and multi-family uses at Floor Area Ratios (FARs) of 8 and 10. The land uses of new and proposed development conforms to existing zoning, but densities generally exceed these limits. The average FAR of new construction and proposed development ("development sites with plans") is 12 for the district as a whole, ranging from 8 to over 16 in the subareas. New density guidelines have been computed for the district as a whole and for subareas within the district by averaging the FAR's of new and proposed development. A

systematic building-by-building analysis was therefore performed to obtain existing floor area ratios. The methodology used to develop new guidelines for the Financial District is described in Appendix A. In the other districts, future density has been projected through discussions with BRA Project Coordinators. Table F presents a summary of the existing zoning and new criteria arrived at for each analysis area. Descriptions of the processes used in each district to develop new guidelines follow.

New zoning criteria were developed for the clearly available lands in the Fort Point Channel, Leather District, and Bulfinch Triangle based on anticipated development trends. In these areas, the existing zoning is primarily light manufacturing (M) and commercial (B), at an FAR of 4. Higher densities and a shift to commercial and residential uses for the three areas are anticipated. The B-8 zoning district (which is equivalent to an 8-story building at full lot coverage) is a good estimate of future trends for the vacant lands in these areas. However, the existing structures are likely to be maintained, resulting in the same floor area, though their uses will probably shift from industrial to commercial and residential activities.

Given the development of Long Wharf and the proposed density of Rowes Wharf on the Waterfront, potential sites were evaluated as if they were located in a B-4 zone permitting commercial and residential uses at twice the existing density.

New zoning has not been formulated for the Charlestown Piers because proposed development programs cover the entire site. The uses and densities contained in the Navy Yard Urban Renewal Plan and Massport's plan for Hoosac Pier have been used to compute development potential.

Zoning has been changed in the East Boston Piers from waterfront-related industry (W-2) to commercial/ residential (B-2) and open space in selected areas, in general conformance with the ongoing work of the East Boston Harborside Planning Program and concept plans of the Office of State Coastal Zone Management. Although at this time plans for the area are not definite, a B-2 designation reflects the general goals for development of the district.

Step 3: Compute Net New Development Capacity

Based on these new zoning densities and existing building floor area, Step 3, or the "Net New Capacity" was calculated. Net new capacity is defined as the potential growth in the study area over and above the existing base floor area. Therefore, the existing floor area in the jurisdiction has been subtracted from the gross development potential calculated as though the sites were vacant. The resulting "net new" floor area figure represents what could be added to existing floor space. For example, if a land parcel whose gross potential is currently 1 million square feet contains 600,000 sq.ft. of floor space, (manufacturing, office, vacant), the net new capacity would be 400,000 sq.ft. The method used to calculate net new development capacity is described in detail in Appendix B.

Step 3 is based on several assumptions. For the category of "development sites with plans" the proposed development programs were assumed to represent the gross development potential of these sites. For "sites with no plans, the development potential is the maximum density allowed under the new zoning criteria established in Step 2. The net capacity figures assume that existing structures will remain in the Leather District, Bulfinch Triangle, and Fort Point Channel.

Step 4: Compute Replacement Capacity

The final step or Step 4 involved computing the "Replacement Capacity" for selected jurisdictions undergoing shifts in land use. Replacement capacity is a combination of an area's potential development beyond the existing base floor area and the total existing area which is expected to shift uses due to new development trends. While the net new capacity calculation represents physical floor area regardless of use, replacement capacity measures the amount of additional square footage available for a specific use. For example, in the Fort Point Channel, trends indicate a shift to commercial and residential uses away from traditional manufacturing and warehouse spaces. Therefore, floor space now occupied by manufacturing uses would be added to the net new capacity figure to represent the potential net capacity if these new land use trends occurred. Continuing the above example, if the 600,000 square feet of existing floor area were used as manufacturing and warehouse space, and the zoning were changed to a commercial (B) district, it could be assumed that 1 million square feet would be available for commercial use even though only 400,000 sq.ft. of physical space is added.

Replacement capacity is computed for the Waterfront, Fort Point Channel, and the Bulfinch Triangle, North Station, and Leather District subareas of the Financial District. Lack of data on the use of the floor space prohibited this analysis for other areas in the Financial District.

Table F: Existing Zoning and New Development Guidelines for the Scenario II Study Area

	Planning District	Existing Zoning	Average FAR[1]	New Zoning Guidelines
1.	Financial[2]	B-10	12.1	B-12
	Subareas			
	Government	B-8	10.54	B-10.54
	Financial	B-10	16.57	B-16.57
	Broad Street	B-10	8/13.7[3]	B-10/13.7
	Retail	B-10	8.02	B-10
	Theatre[4]	B-10	-	
	Park Plaza	B-10	9.33	B-10
	Bulfinch Triangle	M-4, B-4	-	B-8
	North Station[4]	M-4, B-4	-	
	Leather District	M-4	-	B-8
2.	Waterfront	M-2, 4	-	B-4
3.	Fort Point Channel	M-2, 4	-	B-8
4.	East Boston Piers	W-2	-	B-2, W-2, Open Space
5.	Charlestown Piers[4]	W-2, H-2, U, M-1-U, B-1-U	-	

1. Average Floor Area Ratio of new construction and probable development.

2. Does not consider the North and South Station development plans in determining FAR.

3. The FAR for the Broad Street subarea averages about 8, excluding probable developments that border the area, such as Kilby Street, Fort Hill Garage, 260 and 265 Franklin Street. If these developments are included in the Broad Street subarea, rather than the Financial subarea, then the average FAR is increased to 13.7.

4. Proposed development plans cover all the potential development sites.

Findings by District

The net new development capacity estimates for the analysis areas embraced under Scenario II are delineated in Tables G and H. Table G details the potential capacity in each district while Table H reports the findings for each of the subareas within the Financial District.

Financial District: Gross development potential, existing development, and net new capacity have been determined through a parcel-by-parcel inventory. Gross and net capacities were computed at the overall average FAR(12) and at each subarea FAR. A replacement capacity analysis was not performed in most of the subareas because the zoning land use has not changed and the base inventories did not break out floor space by use. In the Theatre and Retail subareas, there are substantial amounts of vacant and storage space, and the commercial uses are projected to change from storage and entertainment to retail and office. Although replacement of uses will occur, the approximate floor area cannot be calculated from the available data.

In the Bulfinch Triangle and Leather District, the net capacity figure represents the development of only vacant land at the new FAR*, with no additional increase contributed by developed sites. The replacement capacity figure assumes that manufacturing and other uses (e.g., vacant, storage) will be replaced by commercial and residential uses. In Bulfinch Triangle, the floor area doubles from over one half million to 1.7 million sq.ft. available for new uses. In the Leather District the floor area also doubles, from 700,000 to 1.4 million sq.ft.

Both Phases I and II of the Urban Renewal Plan for North Station (projected at 1985 and 1990 completion dates, respectively), are counted in the net development capacity figures, although the development program is subject to revision. The net development potential is almost 2 million sq.ft. (including commercial and residential uses, and the arena), and the replacement capacity is about 2.3 million sq.ft.

Downtown Waterfront: Net capacity, calculated through a parcel by parcel analysis as in the Financial District, is almost 2.3 million sq.ft.

Charlestown Piers: The development programs for the Navy Yard and Hoosac Pier, as presently proposed, represent the maximum gross development potential for the area. Because both the Navy Yard and Hoosac Pier contain vacant buildings and storage, gross and net development potential are equivalent, at about 3.4 million sq.ft.

East Boston Piers: The potential new floor area for industrial use was computed for only those piers in industrial zones that contain vacant lands. The piers that are not projected to change in use and presently contain industrial uses are assumed to have no additional development potential and have not been evaluated. Approximately 3.9 million square feet of new development capacity was discovered through the parcel-by-parcel analysis employed for this district.

* Please refer to Table G, P.32.

Table G: Scenario II Net New Development Capacity
(in millions of sq.ft.)

District	New Guidelines	Net New Floor Area	Replacement Capacity
Charlestown Piers	Urban Renewal Plan	3.4	3.4
East Boston Piers	B-2, H-2, Open Space, W-2	3.9	3.9
Financial	Subarea FARS (See Table F)	28.5	incomplete information
Waterfront	B-4	2.9	3.1
Fort Point Channel	B-8	18.5	21.6
TOTAL		57.2	N/A

Table H: Scenario II Net New Development Capacity in Financial District Subareas
(in millions of sq.ft.)

Subarea	Subarea FAR	Net New Capacity	Net New Capacity Under FAR12[1]	Replacement Capacity
Financial	16.57	10.60	8.73	N/A
Govt. Center	10.54	2.16	2.41	N/A
Retail	10	5.16	6.95	N/A
Broad St.	10	1.65	2.55	N/A
Theatre	plans	2.44	2.44	N/A
Park Plaza	10	1.55	1.76	N/A
"Back Bay"	plans	1.72	1.72	N/A
North Station	plans	2.00	2.00	2.38
Bulfinch Tri.	8	.52	.77	1.70
Leather Dist.	8	.73	.89	1.43
TOTAL		28.53	30.22	-

1. FAR 12 is the average density of the district as a whole.

2. May not add up due to rounding.

Fort Point Channel: The assumptions made about the Fort Point Channel are similar to those employed in the Bulfinch Triangle area. Specifically, all existing structures will remain, vacant land and buildings will be fully developed to FAR 8, and uses will shift to primarily office, retail, and residential. The total existing floor area was subtracted from gross development figures to yield a net new capacity of 18 million square feet. The replacement capacity indicates about 22 million square feet will be available for new uses.

Comparison of Scenario I and Scenario II

Scenario I evaluates, in square footage, the development potential of vacant lands, parcels with abandoned structures and parking lots in Central Boston. The second scenario quantifies the capacity for growth on underutilized parcels and the clearly available lands according to new density and land use criteria.

The potential net development capacity within the Scenario II study area increases from 47 million square feet to 57 million square feet when current trends are employed to estimate growth. These figures are slightly understated because the boundaries of the two study areas are not exactly equal. The boundaries delineated for the Scenario I area extend beyond the Scenario II jurisdiction because information regarding the North End could not be segregated and eliminated. Therefore, land square footage and building capacity for Scenario I would be lower, and the consequent difference greater if exact land masses were contrasted.

The development capacity on clearly available land and underutilized sites under both scenarios within the Financial District is demonstrated in Table I. As found in the entire second scenario study area, the building capacity and supply of developable land increase when the new zoning guidelines are employed. The growth in available sites, coupled with more densely developed parcels is responsible for the higher development capacity. As demonstrated, land supply would increase by 1.6 million square feet and building capacity by 12 million square feet in the Financial District.

Table I

Comparison of Net New Development Capacity in the Financial District
(in millions of square feet)

	Scenario I	Scenario II
Square Feet Land	2.4	4
Square Feet Building	17	29

CONCLUSION

This study of development capacity in Central Boston reveals the large potential for growth within the city if new development proceeds either according to existing zoning regulations or current density levels. As demonstrated under Scenario I, the 30 million square feet of clearly available land can yield about 74 million square feet of new development. The greatest concentration of available parcels occurs in the Fort Point Channel District, which contains 28% of the clearly available land in the analysis area and would yield 17 million square feet of industrial growth if fully utilized. Ten million square feet of primarily industrial development is similarly possible on clearly available land sites in the Dudley/Crosstown/SWC area. The Fenway and Charlestown Piers have the potential for upwards of 6 million square feet of predominantly residential and commercial development respectively. Finally, the Financial District could accommodate 17 million square feet of additional development at the allowable FAR's of B-8 and B-10, although only 2.4 million square feet of clearly available land was identified.

The Financial District emerges as the location with the greatest development potential under Scenario II, which relies upon recent density trends to determine the FAR of new development. The average FAR of recent development in the Financial District is 16.57, or approximately twice the permitted density under the existing zoning provisions. The large tracts of vacant land in the Fort Point Channel area also create substantial development opportunities.

Within the confines of the Scenario II study area, where the more stable analysis areas have been eliminated from consideration, development capacity increases from 47 to 57 million square feet under Scenario I and II respectively. The enhanced building capacity is primarily due to the higher density levels discovered when recent development trends were generalized to the development of available and underutilized land sites.

The critical issue which arises from this report is the need for policies and strategies which will guide development in Central Boston. The study points out where growth is possible and perhaps likely to occur over the next several years, absent public intervention. However, development opportunities do exist on parcels that are both available and ripe for development. The seemingly divergent goals of liveability, access, open space and light must be balanced against the benefits accrued from development, including broadening the City's tax base, job generation and creation of housing opportunities. The challenge for urban planners and public policy makers will therefore be to implement a coherent systematic approach for directing growth to locations within Central Boston that can best accommodate it.

One vital element in devising a policy to manage and direct growth is to review and update the City's Zoning Ordinance. As presently written, the Zoning Code does not accurately dictate or reflect the land use or density elements of recent development. Numerous developers and projects circumvent the process and proceed by obtaining variances or conditional designations. Zoning should respond to the development policies and goals delineated by local officials and planners to protect and further the architectural and economic well-being of the City.

APPENDIX A

Financial District - Zoning Criteria Methodology in Scenario II

1. Locate and record floor area and lot size of new construction.

   Thirty-two sites were located through use of the BRA maps of New Construction, the "Office Market Inventory, 1982" (BRA Development Department), and staff review. The inventory of floor area was compiled from the "BRA Office Industry Survey, Interim Report" (1977), and the "Office Market Inventory". In cases where the building was not inventoried, the Sanborne maps were consulted to identify the number of stories in the structure. This number, multiplied by the lot size was used as a proxy for floor area (number of stories x lot size = approximate floor area). The inventory of parcel sizes was complied from BRA 100' scale maps. Where land area was not recorded, the lots were scaled from the BRA maps.

2. Locate and record floor and lot size of probable development sites.

   Twenty-three probable development programs were identified. The sites and floor areas were compiled from Development Policy Project maps (October 1982), information from BRA staff and Urban Renewal Plans. Parcel sizes were compiled from the BRA 100' scale maps and from measurements.

3. Compute the density (floor area ratio) for the 55 sites. Compute the average FAR for the District as a whole and each subarea.

   Floor area ratios were computed by dividing the floor area of each structure by its lot size (sq. ft. building/sq.ft. lot = FAR). The sites were grouped by subarea, and an average FAR was taken for each subarea, as well as for the entire district.

Calculations of Net New Development Capacity

"Net New Capacity" is defined as the amount of gross floor area (measured as gross floor area, including all interior space) which will be added to the existing base in each Analysis Area. The general methodology used to compute this figure is as follows:

Method

a. Add the gross floor area of "development sites with plans", according to the development programs envisioned as of January 1983.

b. For development sites and vacant land with no plans, calculate the potential floor area permitted under new zoning criteria at maximum build out (lot size x New FAR = Gross potential floor area).

c. In the districts where it is assumed that existing structures, thus approximately the same floor area will remain, the new zoning is only applied to Clearly Available Sites (vacant land). Together, the existing floor area and potential floor area calculated under new guidelines comprise the gross development potential.

d. Combine the numbers from the preceding steps to obtain the "Gross Development Potential". This figure represents the total floor area that could develop without accounting for the floor area that already exists on these sites.

e. Compute the floor area of existing development in each district and subarea.

f. The existing floor area is subtracted from the gross development potential, yielding the net new development capacity.

Additional Notes on the Computations

Consolidation of uses into total floor area: The total floor area figures are not broken out by use. Although the floor area of probable development was originally categorized by office, retail, hotel, residential, and other specialized uses, the floor area computed under the new criteria was not allocated by use because the zoning criteria permits a number of uses. To facilitate the consolidation of the gross floor area of the sites with plans and the sites with no plans, all floor area, regardless of use, was added together to derive the total potential floor space.

To disaggregate this floor space into specific uses (office, residential, or retail, for example), two more steps must be taken. First, the use of gross new floor space computed from the new criteria would have to be allocated to specific land uses (i.e.: allocation of 40% of new floor space as commercial, 40% office, 20% residential). Second, the floor area of existing development would also have to be broken out by use, and subtracted from the proper category of gross new floor space. For the Financial District, complete information on use of space by zoning district does not exist.

Conversion Formulas: The probable development plans listed the planned numbers of housing or hotel units rather than floor area. The following rules of thumb, followed by the BRA Development Department, have been used to estimate square feet:

1. Hotel: 700 gross sq. ft. (g.s.f.)/unit

2. Housing:

   a) rental units: 1,000 net sq. ft.(nsf)/unit = 1,176 gross sq.ft. (gsf)/unit (nsf = +85% gsf, therefore, nsf/.85 = gsf)

   b) luxury condo: 1,200 nsf/unit = 1,412 gsf/unit, or 1,575 gsf

   c) undesignated unit type: 1,294 gsf/unit (average of a & b)

Estimating Existing Development: In areas of the City where estimates of building floor area had to be made, it was assumed that building footprints were approximately equal to parcel size and that each story contained equivalent floor area. Floor area was then estimated by multiplying the number of stories by lot size, and rounded to nearest 1,000 sq.ft. This estimate may overcount the amount of existing floor

space, particularly in the Retail subarea of the Financial District where the floor area of almost 24% of the buildings was estimated in this manner. In other areas where estimates were infrequent, the effect on total floor area is probably not significant.

"Existing development" includes all building floor area, regardless of the use or vacancy.

Vacant Land: Parking garages and Boston Edison power plants are considered vacant land and are not included in the existing floor area unless the original data source does not isolate these buildings (e.g., the inventory for Leather District consolidates retail, warehouse, vacant and parking).